

Title: BAT Typical Background Spectrum

Revision Date:	2007-05-22
Version:	1
Document:	SWIFT-BAT-CALDB-BKG-v1

1. Summary

This document describes the typical on-orbit background spectrum of the BAT.

2. Component Files

File Type

File Name	Valid Date	Release Date	Version	Description
swbbkgspec20041120v001.pha	2004-11-20	2007-05-22	1	BAT typical background

3. Scope of Document

This document relates to simulation of spectra and light curves for the BAT. An estimate of the BAT background rate must be known in order to make a faithful simulation.

4. Reason for Update

Initial document.

5. Discussion

In order to make faithful simulations of BAT spectra, it is necessary to know the background level in the instrument. This is because the instrument is background-dominated for all but the brightest bursts. For example, the Crab is about 10% of the typical background level.

While the background level varies throughout the orbit, especially around the South Atlantic Anomaly (SAA), far from SAA the background is quite constant around 12,000 ct/s for the whole array.

The background level consists primarily of diffuse cosmic background (~75%) and the rest is particle background.

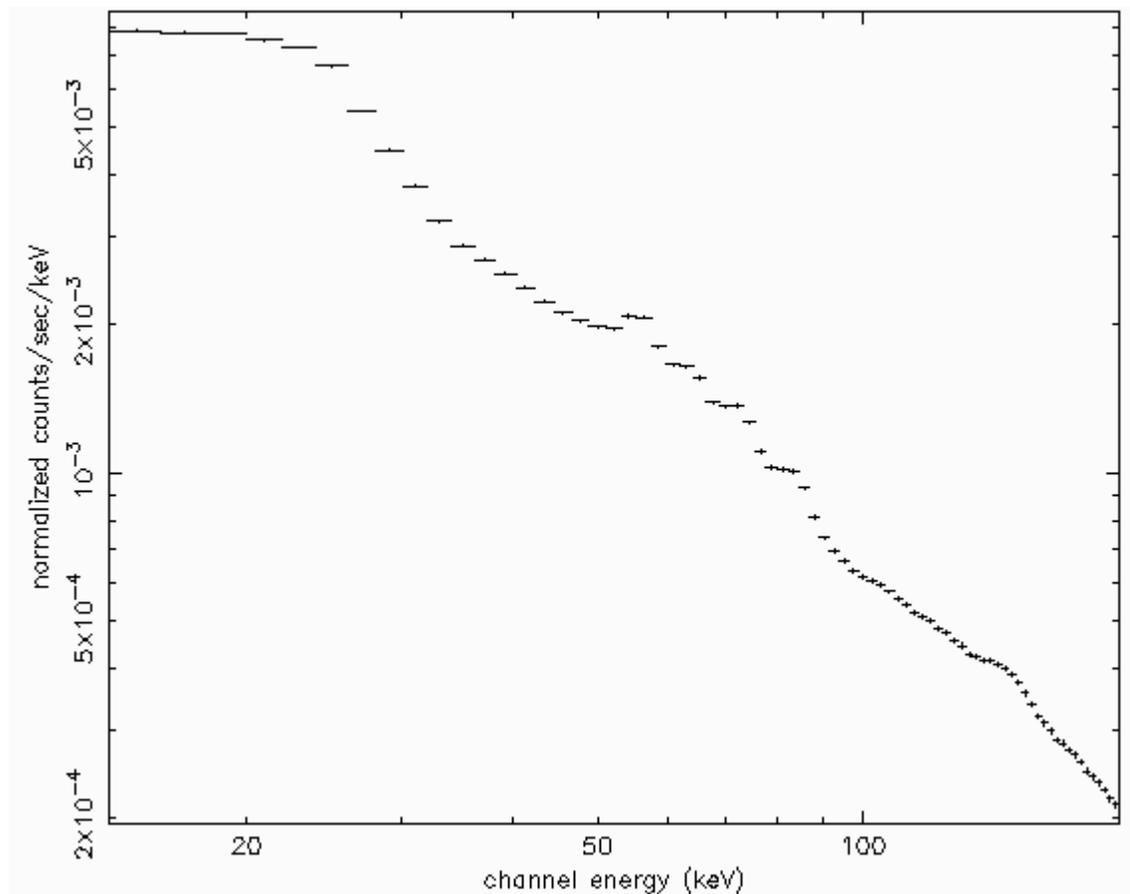


Figure 1. BAT background spectrum from 2006-01-24, in units of counts per second per enabled detector.

A typical background spectrum is shown in Figure . The feature at ~60 keV is from the ^{241}Am calibration source; the features at ~73 keV and ~85 keV are (K α and K β) fluorescence lines from the lead mask tiles.

6. Format

The data are stored in the file as a standard OGIP Type-1 spectrum with standard survey energy binning. The columns are:

Name	Description
CHANNEL	Channel number
RATE	Total array count rate
STAT_ERR	Statistical error of RATE
RATE_DET	Rate per enabled detector

The file also has a standard EBOUNDS extension appended after the spectral extension.

7. How to Use

This file is used with the 'batphasimerr' task to make simulated BAT spectra. Please see the help file for that task.

8. Caveat Emptor

The background levels here are "typical" for the non-SAA portions of the orbit. When the spacecraft passes near the SAA region, or there is strong solar activity which disturbs the earth's magnetosphere, then the background can be significantly higher.

9. Expected Updates

Rare.

10. Version History

10.1. Update 2007-05-22

Initial release.